

CIA/BGI PN 60-2367 69 SECRET--BRIEF ON ISLANDS OF THE INDIAN OCEAN

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BRIEF ON ISLANDS  
OF THE  
INDIAN OCEAN

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FOREWORD

This informal support study presents selected results of a survey and preliminary analysis of available basic information concerning islands of the Indian Ocean. Amount and quality of available information vary significantly from island to island or island group. Because of this, and because of the preliminary nature of the analysis represented herein, the study should not be regarded as either exhaustive or definitive. It is intended, instead, to serve as a convenient summary base from which more detailed study of individual islands or island groups may proceed as requirements necessitate.

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SECRET

BRIEF ON ISLANDS OF THE INDIAN OCEAN

The Indian Ocean is one of the least known oceans of the world. It has few regularly traveled searoutes, and most of its vast reaches contain only a sprinkling of tiny islands. The advent of intercontinental air travel, considerations of international politics, and the advancement of scientific research have, however, stimulated new interest in these small land areas in the ocean. This study inventories briefly the physical characteristics and current political status of each island group except the large islands of Madagascar and Ceylon, both of which are close to continents.\*

For ease in discussion, the widely scattered island groups are treated in four sections on the basis of location in the Indian Ocean.\*\* They include: 1) a southern tier, mostly south of 40°S, with many common characteristics of terrain and climate, 2) a western group, mostly north and east of Madagascar, 3) a northern group, associated with the mainland of South Asia, and 4) an eastern section, comprising a few isolated islands in the relatively landless area south of Sumatra and west of Australia.

I. Southern Tier

Weather is the basic inhibitor of development in the islands of the south Indian Ocean -- a belt of winds known as the "roaring 40's." Prevailing winds are westerly and strong through the year; they reach an average velocity of 25 to 31 miles an hour from April through October and an average of 13 to 31 miles an hour from December through February. Gales and squalls are common throughout the year. Although the western coasts of the islands bear the brunt of the winds, the eastern coasts are no less dangerous. Winds funneled into narrow valleys or rushing down slopes become locally violent, often reaching speeds of 70 miles an hour or more.

\* For a more specialized study of the military/strategic significance of Indian Ocean islands. [REDACTED]

\*\* See NIS Gazetteer, Indian Ocean Islands, March 1957 (Unclassified).

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Heavy swells and surf attributable to the persistently high winds make sea surface conditions in the vicinity of the islands particularly hazardous. Occasional icebergs near some of the islands compound the danger. Visibility is generally fair to poor, with clouds often obscuring all but the lowest portions of the islands. The islands provide a poor haven for surface ships and are not well suited to airfield operations.

A. The Prince Edward Islands (46°39'S-46°55'S 37°40'E-37°55'E) consist of two islands, Marion and Prince Edward, separated by a deep channel 12 miles wide.\* Both islands have rocky surfaces with many volcanic cones and lava boulders. Marion is 13 miles long by 12 miles wide and reaches a height of 3,890 feet. Prince Edward is 5 miles long by 4 miles wide and has a rounded summit 2,370 feet high; rugged cliffs descend to the shoreline. Both islands are snow covered in winter and are boggy when the snow melts. Vegetation is composed almost entirely of mosses and lichens, with some edible Kerguelen cabbage. Sea kelp is common in the waters around the islands. Temporary anchorages can be taken off the southeastern coasts of both islands -- at Ship's Cove on Marion and at Cave Bay on Prince Edward. The Republic of South Africa acquired the islands in 1948 and maintains a weather station at Transvaal Cove on Marion Island.

B. The Crozet Islands (45°57'S-46°29'S 50°10'E-52°15'E), a dependency of the Malagasy Republic, comprise five islands and numerous protruding rocks separated into western and eastern groups by a channel 42 miles wide. The western group includes: 1) Hog Island (Île aux Cochons), a roughly circular island with a maximum dimension of 8 miles, which has one often snow-covered peak of about 2,000 feet, 2) the Apostle Islands (Îles des Apôtres), consisting of three islets -- Grande Île (the largest, with a maximum length of approximately 2 miles and width of 3 miles and with an altitude of 820 feet), Petite Île, and Le Donjon -- and nine pinnacle rocks, and 3) Penguin Island (Île des Pingouins), about 2-1/4 miles long by 1-1/4 miles wide, with a height of 492 feet.

\* Throughout this study, water distances are given in nautical miles and land distances in statute miles.

The eastern group includes two islands, which reach considerably higher elevations and also are snow covered: Possession Island (Île de la Possession), 10 miles long by 5 miles wide, with heights up to 5,000 feet; and East Island (Île de l'Est), about 8 miles long by 4 miles wide, with a maximum altitude of 6,500 feet. All of the islands are covered with volcanic rock and have abrupt cliffs at the shoreline. In some of the moist lowlands near the coast there are deep bogs. The islands are uninhabited, and all except East and Possession Islands are wildlife preserves. Temporary anchorages can be taken off the eastern and northeastern coasts of Hog, Possession, and East Islands; however, landings on these islands are endangered by the generally heavy swell and surf.

C. The Kerguelen Islands (Îles de Kerguelen) consist of a large island named Kerguelen and about 300 smaller islands within the area of 48°27'S-50°02'S and 68°27'E-70°34'E. The main island is about 80 miles long in a northwest-southeast direction and is almost as wide. Its extremely irregular shoreline has long fingerlike fjords similar to those of Norway. The terrain is rugged and mountainous, with a number of peaks at elevations of 3,000 to 6,000 feet. Permanent snowfields in the central part of the island feed the many prominent glaciers. Numerous good anchorages and several good harbors are available. In some areas extensive patches of seaweed could foul propellers and thus constitute a hazard to marine navigation.

The Kerguelen Islands are administered by France as part of the Terres Australes et Antarctiques français. In the past they have been used mostly by whaling ships for obtaining fresh water and for doing repairs, but until recently there were no permanent inhabitants. The French maintain a meteorological station at Port-aux-français on Kerguelen. Since 1964, a joint program has been conducted by the Paris Geophysics Institute and the USSR Academy of Sciences Institute of Geophysics for recording geomagnetic observations from Kerguelen and from its conjugate point, Sogra, in Arkhangelsk Oblast', USSR.

D. Amsterdam (37°54'S 77°32'E) and Saint Paul (38°43'S 77°31'E) Islands, like the Kerguelen Islands about 700 miles to the southwest, are parts of the French Terres Australes et Antarctiques français. Both islands are wildlife sanctuaries, and their only permanent inhabitants are the staff of the meteorological station on Amsterdam.



Amsterdam Island is approximately 5-1/2 miles long by 4 miles wide. Its shoreline is marked in most places by precipitous slopes and almost inaccessible cliffs. The highest point on the island is close to 3,000 feet and is ordinarily shrouded by clouds or mist. There are no natural harbors, and anchorages are available only temporarily, dependent on the vagaries of the weather.

Saint Paul Island, 48 miles to the south, is smaller -- about 2-3/4 miles from northwest to southeast and 1-1/2 miles across at its broadest point. A major part of the island consists of the crater of an extinct volcano, the rim of which rises to a height of 890 feet. An opening in the northeastern part of the rim has created a passageway 100 yards wide that crosses over a bar with depths of 6-1/2 feet at high water into an inner basin with a diameter of approximately 1,250 yards. Depths in the basin are about 31 fathoms. Winds from the southwest may descend the crater sides with great force and generate severe squalls within the basin. Squalls from the southeast also, although rare, make the basin an unsafe anchorage.

E. Heard Island (53°10'S 74°35'E) and McDonald Islands (53°10'S 72°35'E), 225 miles southeast of Kerguelen, are administered as an Australian territory. Between 1947 and 1955 Australia conducted meteorological investigations on Heard Island. The islands have since been visited by occasional Australian scientific expeditions, but they are not permanently inhabited.

Heard Island is about 23 miles long in a northwest-southeast direction and 10 miles across at the widest point. It is dominated by a volcanic cone 9,007 feet high that showed signs of activity as recently as 1950. Large glaciers descend from high parts of the island, in places to the water's edge. There are no safe harbors or anchorages.

The McDonald Islands, a group of four small islands and some outlying rocks, lie about 23 miles west of Heard Island. Although maximum elevations are only 600 feet, the islands are fairly rugged and rocky. Precipitous slopes present poor landing conditions from the sea.

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## II. Western Group

The numerous small islands north and east of Madagascar are grouped as follows: the French Comoro Islands, Réunion, Europa, Juan de Nova, Île Tromelin, and Îles Glorieuses; the British Seychelles and the British Indian Ocean Territory (BIOT); the independent country of Mauritius and its dependencies; and islands near Africa or Madagascar. The weather on these islands is similar. From May through October -- the dry season -- the islands are subject to the southern monsoon. From November through April the winds are reversed, bringing the very hot, rainy season, or northeast monsoon, with frequent storms. Rainfall varies widely according to elevation and topography, from an annual average of 43 inches on Dzaoudzi, in the Comoros, to an average of 123 inches in parts of Mauritius. Réunion, Mauritius, and Rodrigues (the Mascarene Islands) lie in a tropical cyclone belt and have been devastated by typhoons on several occasions.

### A. Islands Under French Sovereignty

1. The Comoros (11°21'S-12°40'S 43°18'E-45°10'E) are mountainous and of volcanic origin. The largest islands are Grande Comore, 35 miles long and 14 miles at its broadest point; Anjouan, triangular shaped, 16-1/2 by 22-3/4 by 19 miles; Mayotte, about 21 by 8 miles; and Moheli, 16-1/2 by 10 miles. Within the extensive reef that surrounds Mayotte are two smaller islands -- Zamburu and Pamanzi. The islands are well wooded and have fertile, cultivated coastal plains and lower slopes. There are many swift streams suitable for the development of hydroelectric power. The highest peak is a volcano on Grande Comore, Mount Kartala, elevation 7,874 feet, which last erupted in 1918. Coastlines of the islands are irregular, with many small coves and inlets. There are no ports in the Comoros, but year-round anchorage can be taken within the reef off Mayotte. The little shelter provided by other anchorages varies with the season and prevailing wind direction. Dzaoudzi airfield on Pamanzi has 4,520- and 4,420-foot runways and is a regular Air France stop. There are gravel-surfaced airfields on Grande Comore, Anjouan, and Moheli and a seaplane station off Pamanzi.

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The population is about 250,000, almost all Muslims of Bantu and Arab origin. Grande Comore is the most populous island, and its capital, Moroni, is the largest town and the commercial center of the Comoros. There is little economic development on the islands. The people are mostly unskilled agricultural workers. Plantation crops of sugar, vanilla, copra, and sisal and perfume oils are the principal exports.

In mid-March 1968, agents of the exiled National Liberation Movement of the Comoros (MOLINACO), with headquarters in Tanzania, led disturbances in Moroni; these were later quelled by a French paratroop company from the base at Diego Suarez, Malagasy. Local support for independence, however, does not appear to be strong.

2. Réunion (21°00'S 55°40'E) is a volcanic island with very rugged, regular coasts that rise abruptly to an inland tableland and a central 10,000-foot dividing axis, topped by the Piton des Neiges. The island is oval, about 44 miles long and 32 miles wide at its broadest part. There are no natural harbors, as the shore is nearly everywhere steep-to, and with two exceptions oceangoing vessels anchor in open roadsteads. An artificial harbor at Port des Galets provides unloading facilities for deep-draft vessels, and a second artificial harbor for ships drawing less than 12 feet is located at Saint Pierre.

Réunion had about 400,000 inhabitants in 1967, mostly farmers and fishermen of Indian, Negro, and Chinese extraction. Saint Denis, the capital, had a population of about 63,000. Four miles east of Saint Denis is the fully operative 6,119-foot Gillot airfield, served by Air France three times a week. There is a smaller, irregularly maintained airstrip at La Possession, 8-1/2 miles west of Saint Denis. The island has 556 miles of bituminous-surfaced roads, including a well-maintained highway that connects the coastal towns.

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A small Réunion independence movement is headquartered in Tanzania but receives little local support.

3. Europa (22°21'S 40°21'E), Juan de Nova (17°03'S 42°44'E), Île Tromelin (15°53'S 54°25'E) and the Îles Glorieuses (11°34'S 45°13'E) are four minor isolated islands or island groups. Europa is a low, sandy, coral island, nearly circular and 3-3/4 miles across at its widest point. Bushes and scattered trees cover most of the island. It is a breeding ground for the green sea turtle. Juan de Nova, a flat, tree-covered island, nearly 3 miles long and 1 mile wide, is a guano-collecting station. Île Tromelin, about 1 mile long and 800 yards wide, is a sand and coral island covered with low bushes. Île Glorieuse, along with an islet and several rocks above water, rises from a drying reef 9 miles long and 2 miles wide. It has a small settlement that produces copra. Anchorages can be taken off all of these islands, but currents are dangerous. All have unmaintained airstrips of 1950 vintage. There are meteorological stations on Europa and Île Tromelin.

#### B. Islands Under British Sovereignty

1. The Seychelles (3°40'S-10°06'S 46°31'E-56°00'E) consist of about 100 islands scattered over 125,000 square miles of ocean. Their total land area is approximately 144 square miles. Only four of the islands -- Mahé, Praslin, Silhouette, and La Digue -- exceed 2 square miles in size. These four, along with about 2 dozen nearby islands and islets, comprise the granitic Seychelles and have the largest population. The remaining islands are formed of calcareous material, are very low, and are sparsely inhabited. For discussion purposes these coral islands are divided into two groups -- 1) the Amirante Bank and 2) numerous southern islands.

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The main island in the Seychelles is Mahé, in about the center of the Seychelles Bank. It is irregularly shaped, about 16 miles long and slightly more than 5 miles wide. Mahé rises abruptly from a narrow coastal strip to a range of mountains 2,900 feet high. Relief is rugged, characterized by deep ravines and rock outcrops interspersed with densely wooded or intensively cultivated patches. Palms, shrubs, and tree ferns grow luxuriantly amid tangled undergrowth in the dense tropical forest. Mahé has a population of 33,500, 75 percent of the total population of the Seychelles. The main occupations are agriculture and fishing. Various crops are grown, but most of the agricultural land is in coconuts. Copra accounts for about 70 percent of the total exports, in value; other exports are cinnamon leaf oil, cinnamon bark oil, patchouli oil, and vanilla. Agricultural experiments are carried out on six government-owned estates. Mahé has two transisland asphalt roads and one coastal road. The only developed port in the Seychelles is Port Victoria on Mahé, capital of the islands; anchorages off the other islands are poor. By 1970 there should be a usable international airport on a filled coral reef near Mahé. The United States has maintained a satellite tracking station on Mahé since 1963.

Praslin, 7 miles long by 3 miles wide, Silhouette, 3.3 miles long by 2.5 miles wide, and La Digue, 3 miles long by 2 miles wide, lie within about 30 miles of Mahé and have the same type of relief and vegetation. They have populations of about 4,000, 800, and 1,850, respectively. Praslin is noteworthy for its famous Vallée de Mai, the only place in the world where cocos de mer (sea coconuts) grow in their natural state. All three islands can be reached from Mahé by ferry. Transportation on the islands is by foot or bicycle.

The Amirante Bank comprises about 15 coconut palm-covered islets and numerous protruding rocks. Navigation over the bank is not recommended, because of coral patches, shoal areas, strong and variable currents, and poor anchorages. None of the islands exceed 20 feet in elevation. The population of about 276 people work the coconut plantations on the African Islets, D'Arros, Poivre Islets, and Alphonse Atoll.

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Coetivy, east of the Amirante Bank, is a low island with several sandhills and a fringing coral reef. A group of 210 people has been brought to the western end of the island from the granitic Seychelles to work the coconut plantations.

In the south the Seychelles include several isolated islands, islets, islet groups, and atolls. Assumption is a deeply eroded, gourd-shaped island of somewhat over 1 square mile. In 1960 there were 31 people on the island employed as fishermen and guano diggers. Astove is a low, sandy, bush-covered atoll. At the western end is a settlement of 50 people who fish or work the guano deposits. Twelve well-eroded islets make up an atoll known as the Cosmoledo Group; the largest is Menai, which has a ridge of sandhills and 60-foot mangroves. To the east, Providence Reef rises steeply from the ocean depths. It is about 24 miles long and 6 miles wide and includes a number of small sand keys and banks. Two islands at either extremity of the reef were recently formed from a group of keys. They are planted with coconut palms but are not permanently inhabited. About 19 miles west-southwest of Providence Reef is Saint Pierre, a circular island of about 360 acres. As a result of constant sea swell, it is bordered with undercut cliffs 8 to 10 feet high. It has extensive guano quarries and was inhabited by 45 people in 1960. Anchorages off all the southern islands are poor and can be taken only under good weather conditions.

2. The British Indian Ocean Territory (BIOT) consists of the Chagos Archipelago (04°44'S-07°39'S 70°50'E-72°47'E), Aldabra (09°25'S 46°25'E), Ile Desroches (05°45'S 53°45'E), and the Farquhar Atoll (10°08'S 51°11'E). Formerly these islands were administered from Mauritius. In November 1965, however, anticipating Mauritian independence in March 1968, the islands were reorganized as a dependent territory of the United Kingdom, administered from London. At the time BIOT was established, all of the islands were under consideration by the United Kingdom and the United States as sites for naval and/or airfield installations.

The Chagos Archipelago consists of a huge shoal area, a number of small atolls, and some scattered reefs. It is an extension of the underwater plateau that surfaces to the north in the Maldivé and Laccadive Islands. Largely ignored for centuries, the islands'

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location in relation to Asia has increased their strategic value enormously. The United States is constructing a naval base on Diego Garcia, the southernmost atoll of the archipelago. This base when completed will be a major communications station and will provide deepwater anchorage for the largest naval vessels, a staging area, refueling and repair facilities, and a rest and recreation site for the US Navy. A large protected anchorage within the lagoon of Diego Garcia is the only good harbor in the Chagos. This atoll is V-shaped, with each side approximately 13 miles long and with a breadth at the top of the V of about 8-1/2 miles. Three islands across the mouth of the V provide a breakwater for the inner lagoon. The land area of Diego Garcia varies in width from a few yards to 1-1/4 miles.

Several of the other atolls in the Chagos are also inhabited, mainly by workers brought in several generations ago to work on coconut plantations. The atolls are privately owned, and supplies and occasional mail come from Mauritius. All of the islands are coral based and low -- 3 to 5 feet above sea level, with occasional rises to 10 or 12 feet. Landings on most of the atolls are difficult. There are usable anchorages near Île Takamaka in the Salomon Islands, off Île du Coin and Île Fouquet in the Peros Banhos Islands, and near Île Lubine in the Egmont Islands.

Aldabra is composed of four islands -- West, Middle, Polymnie, and South -- enclosing a shallow 50-square-mile lagoon that contains a number of islets. Maximum extent of the atoll is 19 miles east-west and 7-1/2 miles north-south. The islands are low lying and flat, made up of coral formations eroded and undermined into 12- to 15-foot cliffs and jagged pinnacles. They are covered with thick jungle and mangrove swamps and have no permanent inhabitants, although a settlement at the western end of West Island has a rotating population of about 100 Seychellois fishermen. Anchorage is available in Main Channel, but the holding ground is poor. A small landing beach exists near the settlement on West Island. The British planned to construct a 12,000-foot runway and throughput station at the eastern end of South Island but scrapped these plans in December 1967 as part of an overall decision to retrench their positions in South Asia and the Far East. Before construction plans were abandoned, outspoken opposition by naturalists to development on the island received much publicity, particularly in British publications. Aldabra is considered to be a unique example of a coral island with species of marine life and birdlife untouched by man.

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Île Desroches is a low, flat island that rises from the southeastern portion of a nearly circular atoll about 10 miles in diameter. A deep channel 10 miles wide separates the atoll from the eastern edge of the Amirante Bank. The inner lagoon appears to be free of coral heads. It ranges from 10 to 17 fathoms in depth and is accessible from the northwest by a mile-wide channel with minimum depths of 10 fathoms, making it a possible alternate to Diego Garcia for harbor development. The approximately 110 inhabitants make their living by fishing and cultivating coconuts. The island is owned by a private citizen living on Mahé in the Seychelles.

The Farquhar Islands consist of North, South, and Golette Islands, the three islets of Manaha, and Trois Îles, all located on Farquhar Atoll. The atoll is 11-1/2 miles long and has a maximum width of 6-1/2 miles. The inner lagoon is shallow, and the passage into it is shallow (minimum depth 3-1/2 fathoms) and dangerous. Anchorage is available off the entrance to the channel near the northwestern tip of North Island. Most of the islands have an elevation of about 10 feet; however, North and South Islands have sand dunes 40 and 70 feet high, respectively. In 1965 there was a total population of 187, mostly on North Island, that was engaged in coconut cultivation and fishing.

### C. Mauritius and Dependencies

Mauritius (20°18'S 57°35'E), formerly called Île de France, is volcanic in origin and generally oval in shape, with a length north to south of 33 miles and a maximum width east to west of 24 miles. In the north, a flat plain rises gently to a central plateau; elsewhere the ascent is steep from a narrow coastal plain. The three main rock-peaked mountain ranges reach heights of 2,700 feet. Several lakes have formed in the craters of extinct volcanoes. A few short rivers flow from the highlands, some of which are used to generate hydroelectric power.

Mauritius is overpopulated, overcultivated, and racially explosive. It has a rapidly increasing population of 800,000 of which 51 percent are Hindi-Indians, 28 percent Creoles (African), 16 percent Muslim-Indians, 3.5 percent Chinese, and 1.5 percent Franco-Mauritians of white extraction. Rioting broke out between the Muslim and Creole communities just before Mauritius acquired its independence from Great Britain and again within a month later. The country is now dependent upon the British for its economic and military needs. Sugar comprises 98 percent of the exports and has been purchased by Great Britain

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at artificially high prices. Almost all of the arable land is already cultivated, mostly with sugarcane. No exploitable minerals have been found, and there is little fishing. In 1965 the unemployment rate was 40 percent.

On the northwestern coast is the good port and capital city of Port Louis with a 1966 population of 134,100. There are four other good-sized cities: Rose-Hill-Beau Basin, with 66,000 people; Curepipe, with 47,600; Vacoas-Phoenix, with 44,700; and Quatre Bornes, with 37,800. The cities are connected by a good 548-mile highway system through Curepipe to the international airport at Plaisance.

Rodrigues (19°47'S 63°27'E), Agalega Islands (10°25'S 56°40'E) and Cargados-Carajos Shoals (16°27'S 59°33'E) are dependencies of Mauritius. Rodrigues lies about 320 miles east of Mauritius. It extends 10-1/2 miles in an east-northeast to south-southwest direction and is about 4-3/4 miles wide at its broadest part. The island has little flat ground, being a single 1,300-foot basaltic mountain. It is fringed by offshore coral reefs breached with two passageways, the deeper of which leads to the partially protected small port and main town of Port Mathurin, where there is a major air facility. Rodrigues, whose 19,500 inhabitants are mainly of African extraction, opposed independence and would prefer French association.

The Agalega Islands consist of North and South Islands joined by a sand ridge, which together are about 10-1/2 miles long. Anchorage and landing are difficult because of the very steep beaches bordered by steep coral reefs. The islands have a coconut palm cover, the main source of the copra for Mauritius' edible oil industry, and occasional patches of dense manioc thickets. There are also the remains of casuarine plantations, made uneconomical by typhoon damage. In 1964 the population was 371.

The Cargados-Carajos Shoals, commonly called Saint Brandon, comprise an extensive group of reefs, shoals, and islets, many of the last of which are submerged in heavy weather. Some of the islets have a cover of low bushes and coarse grass, with an occasional palm or casuarina tree. Land is insufficient for an airstrip, and the only anchorage is off Île Raphaël, which has a meteorological station. A few fishermen are the only inhabitants.

D. Islands Near Africa or Madagascar

Seven islands or island groups -- Zanzibar, Pemba, Mafia, the Bazaruto, Sainte Marie, Socotra, and the Kuria Muria Islands -- are technically Indian Ocean Islands, but because of their proximity to the mainland of Africa or Madagascar they are discussed only briefly.

Zanzibar (06°00'S 39°15'E) and Pemba (05°00'S 39°30'E) are close to the African mainland and are integral parts of Tanzania. Zanzibar is 640 square miles in extent, and Pemba, 380 square miles. Both are hilly and have luxuriant natural vegetation. They are well known for their production of cloves, which comprise 75 percent of their exports; another 20 percent of their exports comes from coconut products. There are several good anchorages on the west sides of both islands, particularly at the port of Zanzibar and at Chaki Chaki harbor on Pemba. A 4,800-foot airfield is located at Zanzibar.

Mafia (08°00'S 39°30'E) is a well-wooded island, 170 square miles in area, owned by Tanzania and located off its central coast. The island has a low coast and a central rocky plateau between 700 and 1,000 feet high. The east coast is a broken cliff wall with fringing reefs. The island has a small Bantu fishing population, and the little town of Kilindoni in the south has minor port facilities. Deep-sea fishing off the southern coast is excellent; it is controlled by the Mafia Island Fishing Club, which has a small inn and a tarmac airstrip on the island. In 1949 the population of Mafia was about 6,000.

The Bazaruto Islands (21°40'S 35°30'E) include four well-wooded islands -- Xezine, Benguerua, Bazaruto, and Carolina -- owned by Mozambique and located off its coast. Xezine and Benguerua are on drying sandbanks, which make access difficult. Benguerua has a small village. Bazaruto, 18 miles long, is the largest of the islands, with anchorage available at its northeastern end. A few Portuguese troops are stationed at Sofala, on Carolina, which is famous for its pearl fisheries.

Île Sainte Marie (17°01'S 49°50'E) is a thickly wooded island off the northeastern coast of the Malagasy Republic and under Malagasy sovereignty. Protruding rocks in the vicinity of the island make approach and anchorage unsafe, particularly in bad weather. There is a small port at Ambodifototra.

Socotra, off the horn of Africa (17°30'N 54°00'E), is a possession of South Yemen. It consists of the main island, 80 miles long by 20 miles wide, and three small, very rugged, barren islands or island groups to the south-west-- The Brothers, Jazirat Darsa and Jazirat Samha, and Abd al-Kuri. Socotra has a deeply dissected limestone plateau that falls in steep scarps to the sea. The rugged granitic peaks of the Haggiar Mountains rise to 5,000 feet. Vegetation is of sparse desert variety except for the dense bush- and scrub-covered mountains in the north-central part of the island. The people, numbering roughly 12,000, are primitive herders and fishermen. Socotra exports small quantities of dates, various gums, and ghee. Hadibo, on the northern coast, is the principal village. Anchorages can be taken off Hadibo and other places along the northern coast from February to May; at all other times the island is exposed to heavy monsoon rains and strong winds. Approaches are difficult because of submerged or partially submerged rocks and coral patches. There are graded and compacted sandy earth airstrips near Hadibo and 10 miles west of Hadibo at Ras Karma.

The Kuria Muria Islands (17°30'N-17°35'N 56°00'E) are a group of five small rocky, desolate islands (As Sudah, Haski, Jazirat Hallaniya, Jazirat Kabliya, and Kirzwet Islet) owned by the Sultanate of Muscat and Oman and valued primarily for their guano deposits. Because of submerged rocks, approaches to the islands and anchorages are hazardous.

### III. Northern Group

A. The Maldivé Islands are due north of the Chagos Archipelago; only about 400 miles separates the new base at Diego Garcia from the British airbase at Gan on the southernmost atoll in the Maldives. The Maldives are a group of 12 atolls scattered over a large area of the Indian Ocean at 07°06'N-0°42'S 72°30'E-73°45'E. They comprise over 2,000 islands, many of them too small to be useful and many others awash at high tide. Most of the atolls consist of a narrow strip of land no more than 3 to 5 feet above sea level encircling a central lagoon. Many of the lagoons afford anchorages for shallow-draft vessels, but there are no good natural harbors in the Maldives. Few of the islands are wide enough to accommodate airfields. Only 220 islands are inhabited. Malé Atoll has a population of 11,000; the remaining 86,000 inhabitants are scattered throughout the archipelago. The islands gained their independence

from Great Britain in July 1965 and were governed as a constitutional monarchy until November 1968, when the small nation elected to become a republic. It is a poor country. The only export is dried fish, which is shipped to Ceylon. Rice, the staple food in the islands, cannot be grown successfully in quantity on the porous coralline soils. Formerly it was imported from Ceylon, but now it comes from Burma's dwindling surplus. Most of the few concessions to modernity are on Malé. Almost all the rest of the islands lead an age-old primitive existence; the one exception is Addu, on which Gan, the big British airbase, is located. The British have a lease on Addu which expires in 1986. By treaty Gan is restricted to British use in defense of the Commonwealth. Except for the modern jet field at Gan, the only airstrip in the Maldives is on the island of Hulule on Malé Atoll.

B. The Indian-owned Laccadive Islands are north of the Maldives off the western coast of India between 08°15'N-12°25'N and 71°40'E-73°45'E. They consist of 14 atolls in two groups, four in a northern tier collectively called the Amindivi Islands and the remainder in a southern group referred to as the Cannanores. Included with the latter is Minicoy Island, which is separated from the main group by a navigable channel. The land area of the Laccadives is only 12 square miles; Agatti, the largest island with an anchorage, is 3 miles long and 1/2 mile wide. Most of the atolls have lagoons within barrier reefs that open toward the west, and the land is usually located on the eastern side of the atoll. The seaward sides of the reefs are generally steep-to with limited usable areas shallow enough to function as anchorages. There are no good natural harbors in the Laccadives. Moreover, during the southwest monsoon (June through September) heavy surf effectively cuts off navigation between the islands and the Indian mainland. Anchorages are not considered safe during this period. Suitable sites for the construction of airfields exist on the west side of Androth Island, the south side of Chetlat Island, and the southeastern side of Ketlan Island. All these islands also have anchorages.

C. The Indian-owned Andaman and Nicobar Islands form an archipelago in the Bay of Bengal that stretches from North Andaman Island (13°35'N 92°02'E), 165 miles south of the delta of the Irawaddy River, to Great Nicobar (06°35'N 93°45'E), about 145 miles from the

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southern tip of Sumatra. Ten Degree Channel, a turbulent stretch of water 75 miles wide between the Andaman Islands and the Nicobar Islands, is a greater physical barrier than its breadth would indicate, and cultural development of the two island groups has differed.

The Andaman Islands consist of a clustered chain of 204 islands, the five largest of which are separated by such narrow, winding passages that they appear to be one contiguous landmass. Total land area is 2,461 square miles. The terrain is hilly and covered with dense tropical rain forest. There are a number of usable ports and anchorages along the more sheltered east coast, including the fine natural harbor at Port Blair near the southeastern part of South Andaman Island, where the Indian Navy is developing a base. Before the establishment in the 19th century of a penal colony by the British at Port Blair, mainly for recalcitrant political prisoners, the Andamans were inhabited by a few hostile aboriginal tribes. At the end of World War II, when operation of the prison camp ceased, the population consisted mostly of parolees of various castes and faiths from diverse regions of India. In spite of the religious and linguistic mixture and unlike the mainland, the islands have been relatively free of communal disturbances. In recent years large numbers of Bengalis from overcrowded districts near Calcutta have been resettled in the Andamans. The stated purpose was to take advantage of the Bengali knowledge of rice cultivation in order to make the island self-sufficient in food production. Currently, there are also plans to establish a colony for Indian Tamil repatriates from Ceylon. The mainstay of the economy at present is the exploitation of timber resources. The largest lumber mill in the Indian Union is located at Port Blair. Most of the population in the islands is concentrated in and around Port Blair; other settlements are chiefly in isolated coastal locations. During World War II the Japanese built an airfield at Port Blair, but terrain obstacles make landing and takeoff hazardous, so its use is restricted to occasional commercial flights. Indian civil aviation experts reportedly visited Port Blair recently and have approved a site for the construction of a jet field about 13 miles from Port Blair.

The native population of the Nicobars is more closely akin to the Burman-Khmer groups of Southeast Asia. Car Nicobar, the northernmost of the Nicobar Islands, is the most densely populated and is reaching the point of population saturation (about 10,000). While contact of

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the natives with more advanced civilizations has not always been happy

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the Indians have done a reasonably good job of protecting the native culture from overexploitation. The native economy is based on the coconut; the nut is used as food, medium of exchange (the national debt is measured in coconuts), fiber for cloth, and forage for pigs, as well as for innumerable other purposes. There is no scarcity of coconuts, which grow in everyone's backyard. Car Nicobar is roughly circular, 8 miles long and 7 miles wide, and relatively flat -- an ideal stationary "flat-top." A jet airfield is maintained by the Indian Air Force near the southern part of the island. The British Royal Air Force has user rights, and Car Nicobar is a refueling stop on flights from Gan to Singapore. The superb airfield site is not matched by similar facilities for ships. There are no harbors, and off-loading is accomplished by lighters.

The other 18 islands of the Nicobars are less densely populated; in fact some of the islands are underpopulated (Great Nicobar) or uninhabited. There are a number of usable anchorages in these islands and a very good harbor at Nancowry. This all-weather harbor is formed by the southern shore of the island of Comorta and the northern shore of the island of Nancowry, with safe entrances to the east and the west during either monsoon. The harbor can be extensively developed and is an alternate for Port Blair. Neither Comorta (14 miles long north to south by 3-1/2 miles wide) nor Nancowry (6-1/2 miles long north to south by 4-1/2 miles wide) has very high elevations (highest point, 720 feet, on southern Comorta), but both are hilly. The populations are small -- 795 on Comorta and 539 on Nancowry.

Both the Andamans and the Nicobars fall within India's concept of the "Inner Line" and are classified as restricted areas from which foreign nationals are generally excluded. Even Indian citizens do not enjoy freedom of movement; they need a landing permit, which is not easy to obtain. The Indians are particularly sensitive to incursions of Malay fishing boats in the Nicobars and the appearances of itinerant Chinese peddlers.

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D. The Coco Islands (14°11'N 93°23'E) are 21-1/2 miles north of the Andamans and geologically are part of the same island group. Preparis is a small island, 43 miles north of the Coco Islands and separated from them by a navigable channel. Both the Coco Islands and Preparis are parts of Burma. The Coco group consists of Great Coco, Table Island, Little Island, and two lesser islets, with a total land area of 14 square miles. Great Coco, the largest of the group, is 5-3/4 miles long from north to south, is wooded (mainly coconut palms), has an airstrip, and has an anchorage on the eastern side of the island. There is a permanent population of about 390 that probably has been augmented during the past year by the resettlement of Burmese repatriates from the Andamans. These islands have no good harbors and few adequate anchorages. Furthermore, strong tidal currents, reefs, and shoals make navigation hazardous.

#### IV. Eastern Section

A. The Cocos Islands consist of two atolls, South Keeling and North Keeling, located in the eastern part of the Indian Ocean, south of Sumatra, at 12°04'S-12°13'S 96°49'E-96°57'E, and separated by a channel 15 miles wide. The two atolls include 27 small coral islands with a total land area of 5-1/2 square miles. Politically, they are a territory administered since 1955 by the Commonwealth of Australia.

Only two of the islands, Home and Direction, both within the South Keeling Atoll, are permanently inhabited. The total population as of 1965 was 674. Coconut plantations and the production of copra employ most of the working force in the islands. The location of the islands makes them of considerable strategic importance. An international jet field under the control of the Commonwealth Department of Civil Aviation occupies most of West Island and serves as a refueling stop for weekly flights between South Africa and Australia. The inner lagoon of South Keeling is navigable by shallow-draft boats. Anchorages in the outer harbor, however, can accommodate vessels with drafts up to 25 feet. Exposures to wind and sea conditions are such that development of an all-weather harbor probably is not feasible.

North Keeling consists of a strip of coral 100 to 400 yards wide enclosing a central lagoon. The lagoon is open to the sea, but the entrance is not navigable. North Keeling lacks a safe anchorage, and heavy surf makes landing on the island risky at times.

B. Christmas Island (10°25'S 105°45'E),\* administered by Australia since 1958, is an irregularly shaped piece of land about 12 miles long and 4-1/2 to 10 miles wide, with an area of 32 square miles. It is densely wooded and hilly. The shoreline is backed by a continuous cliff 10 to 150 feet high, which is breached in only a few places -- chiefly at Flying Fish Cove, the only port or anchorage on the island. It is not an all-weather harbor. There is no protection against the heavy swells that roll toward the island from November through January, and the port is frequently closed to shipping during that period. The economy of the island is based entirely on the mining of phosphate of lime, which is managed by the British Phosphate Commission. Production is shipped mainly to Fremantle and other Australian ports. The estimated population in 1965 was 3,332, mostly people of Asian extraction, with a few resident Australians employed by the mining corporation.

\* Not to be confused with the island of the same name in the Line Islands, Pacific Ocean.